

EMERGENCY MANAGEMENT OF A SUSPECTED SPINAL CORD INJURY - CHW

PRACTICE GUIDELINE[®]

DOCUMENT SUMMARY/KEY POINTS

- Guide for clinical staff in the assessment and management of patient with a suspected spinal cord injury
- This document is to be used as an extension to the [SCHN Cervical Spine \(suspected\) Injury \(Paediatric\): Patient Management Practice Guideline](#)
- This algorithm has been developed in consultation with the CHW Trauma, Spinal, ED and PICU teams.

CHANGE SUMMARY

- N/A – New Document

READ ACKNOWLEDGEMENT

- All multidisciplinary clinical staff involved in the assessment and management of a patient with a suspected spinal cord injury.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1 st November 2023	Review Period: 3 years
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1 Background

Spinal cord injury (SCI) is a serious condition that can cause significant disability. It occurs when there is damage to the spinal cord, which is the bundle of nerves that runs from the brain down the back. This damage can interrupt the signals that travel between the brain and the rest of the body, leading to a loss of function in the affected areas.

Traumatic spinal injury though relatively rare has potential for significant impact on the child's long-term health and the health system. Early detection and intervention can minimise complications.

Spinal cord injury should be suspected in a child who presents with a traumatic mechanism as well as a physical finding or imaging concern for spinal cord injury.

The flow chart in section 6 applies to children with cord injuries with or without associated vertebral injuries. It is not for isolated vertebral injuries. The goal is early institution of treatment measures along Early Management of Severe Trauma (EMST) principles that will prevent secondary spinal cord injury and referral to spinal services for appropriate management.

During the assessment it is also important to identify and address any other injuries that may be associated with a suspected spinal cord injury such as traumatic brain injury and maxillofacial injuries.

2 Recognition

There are two main mechanisms that can cause traumatic SCI:

- **Compression:** This occurs when the spine is squeezed or crushed, such as in a car accident or fall. The force of the impact can damage the spinal cord directly, or it can cause bones or ligaments to break and put pressure on the spinal cord.
- **Shear:** This occurs when the spine is suddenly twisted or bent, such as in a sports injury or diving accident. The force of the twisting or bending can damage the spinal cord by tearing the nerves or blood vessels that supply it.

Common mechanisms of injury (MOI) that can cause spinal cord injury can include:

- Patients with suspected abusive head trauma, including non-accidental injury, shaken babies.
- Inadequately restrained occupants involved in a motor vehicle crash.
- Occupants in a motor vehicle crash who are ejected from the motor vehicle.
- Drivers or riders of recreational vehicles such as motorcycles and ATVs.
- Patients who are unconscious following trauma.
- Patients with head and torso injuries.

The MOI associated with SCI is because the force of the impact can cause the spinal cord to be damaged, even if there is no visible injury to the spine.

3 Signs and Symptoms

The most common types of SCI are:

- Complete SCI: This is the most severe type of SCI. It occurs when all of the nerves in the spinal cord are severed. This results in complete loss of sensation and movement below the level of the injury.
- Incomplete SCI: This is less severe than complete SCI. It occurs when some of the nerves in the spinal cord are damaged, but not severed. This results in partial loss of sensation and movement below the level of the injury.

Signs and symptoms of spinal cord injury can include:

- Transient neurologic deficits
- Neck pain with fluctuating neurologic signs
- Loss of sensation and reflexes
- Autonomic dysfunction
- Flaccid paralysis below level of injury
- Loss of bladder and bowel sphincter tone
- Radiologic evidence of bone encroaching spinal cord

4 Diagnosis

Confirmation of diagnosis requires imaging. The modalities include plain radiograph of the region, Computerised Tomogram (CT) and or Magnetic Resonance Imaging (MRI). Plain radiograph and CTs are often done initially.

Plain radiographs may help identify the region of interest. CT provides more detail on fracture and displacement while MRI is good for ligamentous injuries and cord injuries. CT angiogram is more sensitive than MR angiogram for vascular injuries and should be considered in the presence of:

- Penetrating injuries near carotid vessels
- Transverse process fractures of C6 and above
- Cervical spine distraction injuries
- Facet injuries.

Early consultation with spinal team is recommended and need for timing of angiograms or MRI should be done in discussion with the spinal team.

5 Early management in ED and PICU

Children with spinal cord injuries will require admission to the Paediatric Intensive Care Unit (PICU).

Airway & breathing

Children with respiratory insufficiency from high cord injuries should be intubated by senior anaesthetic staff with adequate spinal immobilisation.

Circulation

Treatment goal should be to achieve age-appropriate MAPs with fluid boluses and vasocactive agents. The choice of vasoactive agent (adrenaline vs noradrenaline) should be in consultation with PICU team.

Disability & everything else

- Child should be log rolled during the secondary survey to identify any other injuries.
- Adequate and appropriate analgesia should be commenced early.
- Foley's catheter should be inserted to monitor urine output and achieve bladder drainage in children with retention.
- Use of high steroids have not shown to benefit outcomes in spinal cord injuries and if considered should be done so in consultation with the spinal services.

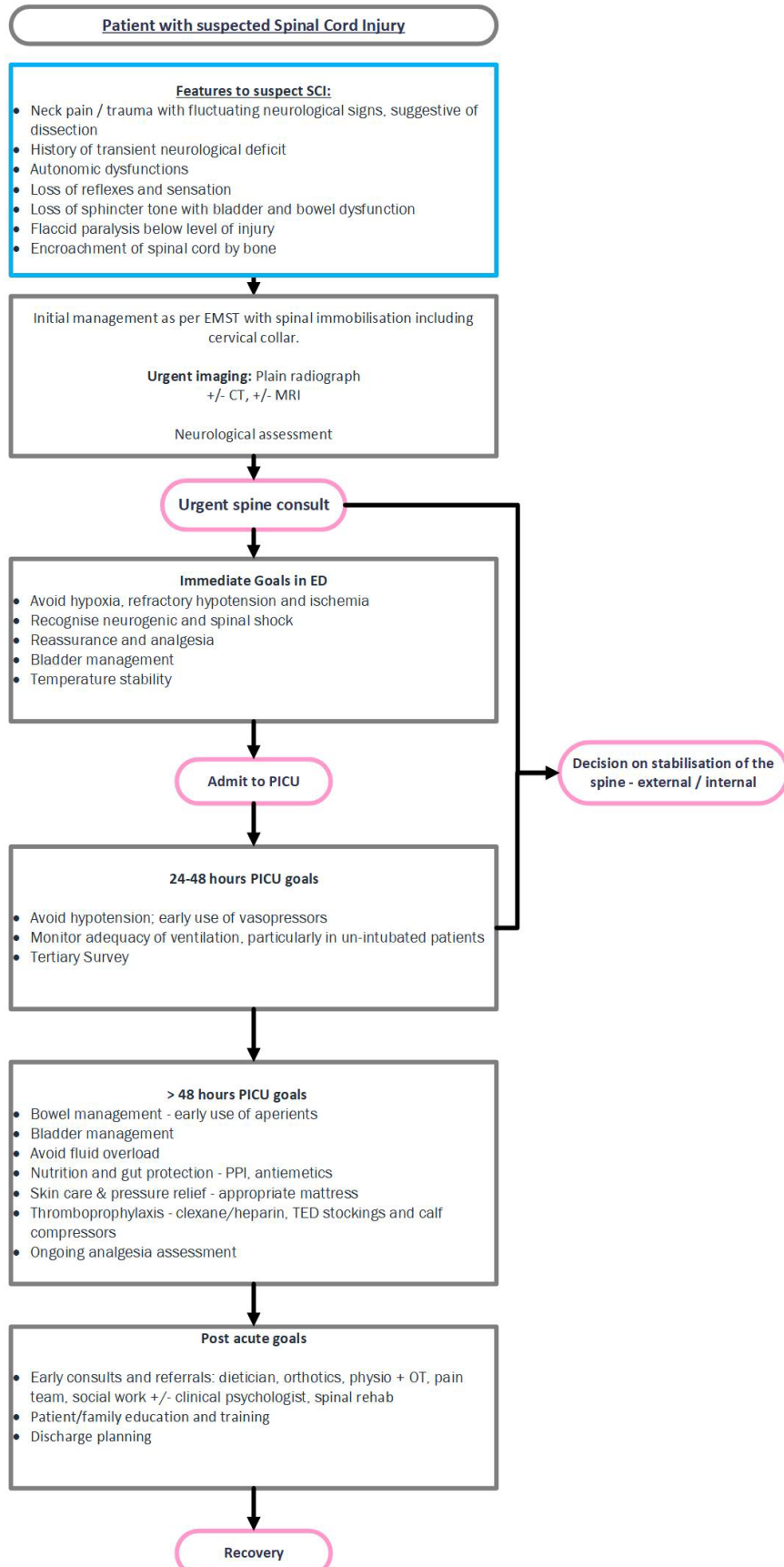
Other early considerations include:

- PPIs should be commenced to prevent stress ulcers
- Skin care to prevent pressure sores
- Adequate nutrition
- Bowel care plan to prevent constipation
- DVT prophylaxis

Spinal team will advise decision on early external or internal stabilisation of spine.

The prognosis for patients with SCI varies depending on the severity of the injury. Some patients may make a full recovery, while others may have permanent disability. However, with early diagnosis and treatment, most patients can improve their quality of life and regain some function. Early referral to spinal rehab team is recommended to facilitate multidisciplinary care and family education towards discharge.

6 Patient with suspected spinal cord injury flowchart



7 References

1. Childrens Hospital of Philadelphia, America, Clinical Practice ED & PICU clinical pathway for Evaluation/Treatment of Children with Suspected Spinal Cord Injury. [Internet, last updated; cited June 5th 2023], Available from:
[Spinal Cord Injury \(SCI\) Clinical Pathway — Emergency Department and ICU | Children's Hospital of Philadelphia \(chop.edu\)](https://www.chop.edu/spinal-cord-injury-sci-clinical-pathway-emergency-department-and-icu)
2. Royal Children's Hospital, Melbourne, Australia, Clinical Practice Guideline on Cervical Spine Assessment, [Internet, last updated; cited October 5th 2017], Available from:
<https://www.rch.org.au/trauma-service/manual/spinal-cord-injury/>

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